

CONTAINER FOR RECEIVING PLATES

BACKGROUND OF THE INVENTION

[0001] The invention relates to a container for receiving plates having a sensitive surface, in particular for receiving small glass plates, comprising a container part having four walls and a bottom, whereby a cavity is enclosed, further comprising a removable cover for closing the container part, wherein guide grooves for receiving plates are provided on two opposing walls of the container part, and wherein a flexible element is provided for securing plates received within the container against displacement.

[0002] Such a container is known from DE 2,141,705 A1.

[0003] The known container serves for packaging, transport and storage of a number of glass plates coated with a light sensitive material.

[0004] To avoid any movement of the glass plates within the container, a pillow element is provided which is configured hose shaped and is attached either within the corners of the container or along the side faces of the container perpendicularly to the planes in which the plates are received.

[0005] Although such pillow elements can safely avoid a movement of the plates received within the container, these containers are difficult to manufacture, since the flexible hoses must be prepared separately and must be mounted within the containers within the desired mounting position.

SUMMARY OF THE INVENTION

[0006] Thus it is a first object of the invention to provide an improved container for receiving plates guaranteeing a simple and effective protection of plates received within the container when the container is closed.

[0007] It is a second object of the invention to disclose a container that is particularly suited for the safe storage and transport of glass plates having a sensitized surface, such as biochips or glass plates that may serve as a preliminary stage in the production of biochips.

[0008] It is a third object of the current invention to disclose a container for receiving plates that is easy to manufacture in a simple and cost-effective way.

[0009] It is a fourth object of the current invention to disclose a container that reduces contamination of plates received therein.

[00010] According to the invention these and other objects are achieved by providing a container having a flexible element that is integral with the bottom or cover, the flexible element being configured to rest against the front faces of plates

received within the container when the cover is closed, thus securing the plates against displacement in longitudinal direction.

[00011] Thus the object of the invention is completely achieved.

[00012] Since the flexible element is configured integral with the bottom or cover, it can be prepared together with the bottom or cover in a single manufacturing step, such as by molding, thus avoiding a separate manufacture and a mounting operation within the container.

[00013] Thereby the manufacture of such a container is considerably simplified while saving cost at the same time. Since the flexible element rests against the front faces of plates received within the container, the plates are effectively secured against displacement when the cover is closed.

[00014] According to an advantageous development of the invention the flexible element is configured as a flexible tongue which forms an abutting surface for plates received within the container.

[00015] This is a particularly simple and cost-effective means for securing plates received within the container against displacements. However, basically the flexible element may be designed in any possible way, such as for instance a design as a bellows element or a spring element, for instance being configured as a disk spring and the like.

[00016] Herein the tongue preferably protrudes from the inner surface of the cover into the cavity.

[00017] Naturally, it would basically also be possible to provide the tongue at the bottom of the container.

[00018] According to a preferred development of the invention the container is made of a homopolymeric plastic, preferably polypropylene.

[00019] Such a material having an extremely small portion of additives offers the advantage that, even after long storage of sensitive plates received within the container, almost no foreign substances emerge from the container which may contaminate the surface of the plates received therein. Also this material is resilient and allows to produce the complete container in an integral design.

[00020] Up to now object holder boxes which usually are made of plastic contain a relatively high portion of softening agents and/or other additives. During storage of object holders in such containers the softening agent partially emerges from the plastic material during the course of storage and deposits as a hydrophobic layer onto the surfaces of the plates received therein. If the glass plates serve as biochips, such layers impede further reaction of the surface with biologically active substances, so that the reproducibility of the results is considerably impaired.

[00021] Such drawbacks are avoided according to the invention.

[00022] According to a preferred development of the invention the cover is connected to the container part by means of a joint being configured as a film hinge and is lockable with the container part.

[00023] To this end on the inner surface of the cover an annular projection protruding into the direction of the container part may be provided, the outer surface carrying a groove which is lockable with a respective bulb provided at an inner surface of the wall surfaces.

[00024] In this way a simple opening and closing of the container by means of the cover can be guaranteed. At the same time the cover is connected to the container part protected against loss.

[00025] According to a further preferred development of the invention a supporting ridge is provided at the inner surface of the bottom or of the cover for supporting plates received within the container.

[00026] This feature offers the advantage that a clearly defined rest surface for the face surfaces of the plates is provided and in that the contact surface with the plates received is minimized due to the resting against the supporting ridge.

[00027] As mentioned before, the containers according to the invention can preferably be utilized as storage or transport containers for receiving microscope object holders, in particular when configured as surface functionalized glasses or complete biochips.

[00028] It should be understood that the features mentioned before and to be explained hereinafter may not only be used in the given combination but also in other combinations or exclusively without going beyond the scope of the invention.

SHORT DESCRIPTION OF THE DRAWINGS

[00029] Further features and advantages can be seen from the subsequent description of a preferred embodiment while making reference to the drawings. In the drawings:

[00030] Fig. 1 shows a side elevational view of a container according to the invention having an opened cover, shown in enlarged representation; and

[00031] Fig. 2 shows a top view of the container, seen from the front side, wherein the cover has been pivoted to the outside by an angle of 180°.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[00032] In Fig. 1 a container according to the invention is designated in total with numeral 10.

[00033] The container 10 consists of a container part 12 which encloses a cavity of almost cuboid form, and of a cover 14 for closing the container part 12.

[00034] The container 10 shown in Fig. 1 is particularly suited for receiving small glass plates having a functionalized sur-

face and having the dimensions of microscope object holders in the format of 25 x 75.5 x 1 mm.

[00035] Such a small plate is outlined in Fig. 1 by means of the dash-dotted line 56.

[00036] The container part 12 has two slim side walls 16, 18 facing each other and two broad side walls 20, 22, as well as a bottom 24. As can be seen from Fig. 1, the broad side walls 20, 22 have a somewhat smaller breadth at their bottom end by contrast to the cover side end, this leading to a slight tapering. On the cover side the container part 12 is closed by means of a flat rim 34, the shape of which can be seen from Fig. 2. The rim 34 protrudes beyond the walls 16, 18, 20, 22 on all sides by a particular amount and, at one wall 18, is configured protruding to the outside in the shape of a blunt triangle having a rounded tip (see Fig. 2). In the region of the rounded tip a circular opening 50 is provided. On the opposite side the rim 34 is connected to by means of a tongue 36 to the cover 14 having a flat cover surface 52, the shape and size of which is matched to the rim 34 of the container part 12 (see Fig. 2). In the tongue 36 a film hinge 38 is formed by means of a material thinning.

[00037] Thus the cover 14 may be pivoted about the film hinge 38 (see Fig. 1) to either allow a complete opening or a closure within a closed position in which the cover surface 52 rests against the rim 34. In this position a circular opening 54 provided within the cover surface 52 is aligned with the opening 50, so that both parts may be secured by inserting a fastening strap there through, if desired.

[00038] From the inner side 42 of the cover surface 52 an annular projection 44 protrudes into the direction of the container part 12. This projection 44 has a rectangular shape with rounded corners, as can be seen from Fig. 2, and comprises an annular groove 46 arranged close to the rim facing the container part 12. This annular groove 46 cooperates with a ridge 48 being matched thereto and being provided at the inner surfaces of the walls 16, 18, 20, 22 to effect a locking of the cover 14 with the container part 12, when the cover 14 is completely closed by pivoting about the film hinge 38.

[00039] On the slim side walls 16, 18 guide ridges 26 are provided which protrude from the inner surface of the side walls 16, 18 to the inside and which are slightly rounded at their ends opposite the side walls, as can be seen from Fig. 2. These guide ridges 26 extend from the bottom 24 until a region close to the rim 34 and taper off toward the side walls 16, 18 at a particular distance from the rim 34.

[00040] Herein on both side walls 16, 18 a total of six respective guide ridges 26 is provided at regular intervals, guide grooves 28 being formed there between (see Fig. 2).

[00041] In this way a space for inserting a total of five plates 56 at regular intervals is provided, the plates being laterally guided in the guide grooves 28 formed in this way.

[00042] In addition, at the inner side 42 of the cover surface 52 a flexible bent tongue 40 is attached which protrudes into the direction of the container part 12 and which tapers off in a resting surface 41 which is almost parallel to the cover

surface 52. When the cover 14 is closed, this resting surface 41 rests resiliently against the front surface of plates 56 received within the container 12, thereby securing those against a displacement in longitudinal direction.

[00043] At the inner surface of the bottom 24 two supporting ridges 30, 32 are integrally attached extending in parallel to the slim side walls 16, 18. These supporting ridges 30, 32 serve as a stop when inserting plates 56 into the container 12.

[00044] The container 10 is manufactured in one piece of homopolymeric polypropylene having extremely small additions of additives. In this way an emerging of softening agents and of other additives can be almost completely avoided, even after long storage. Thus plates 56 received within the container 10, in particular when configured as surface functionalized glasses or biochips, are protected against contamination by impurities emerging from the container material.

[00045] What is claimed is: